

ICI is produced in this case both as a result of a doppler shift arising from the movement of mobile terminals and also as a result of an oscillator phase noise.

in an OFDM system the so-called "downlink", which in mobile communication in general identifies communication going from a base station to a mobile station, both the doppler shift as well as the part of the oscillator phase noise generally corrected/compensated in the receiver, which is called Common Phase Error (CPE), is the same for all carrier frequencies of the sub-carrier bands, so that for this communication direction no access problem triggered by the OFDMA principle arises.

A system and a method is known here from US 2002/0105901 A1 in which, by forming the signal waves, a manipulation of the spectrum of an OFDM signal is achieved.

From Staamoulis et al: "Space-time block codes OFDMA with linear precoding for multirate services", IEEE Transactions on Signal Processing, Jan, 2002, a system is known which eliminates a multi-user interference in an OFDMA system.

From EP 0 938 208 an OFDMA/TDMA system is known with a plurality of users, in which sub-carriers in edge areas of a sub-carrier band are not modulated, in order to eliminate interference on adjoining frequency slots.

In the "uplink", a term generally used in mobile communication to designate the communication going in the opposite direction, from a mobile station to a base station, the problem arises of the doppler shifts not being constant over all sub-carriers as a result of the different relative speeds of the mobile subscribers. In addition the phase noise or the correctable part of the phase noise for this communication

2a

direction is uncorrelated as a rule since it is predominantly generated by the unsynchronized oscillators of the individual users.

The Inter Channel Interference produced by the doppler shift as well as the phase noise with his communication direction represents, in an OFDMA-based uplink a limitation of the transmission characteristics which can go as far as resulting in a complete failure of the system.

The underlying object of the invention is to specify a method as well as an arrangement which make possible an essentially interference-free OFDMA access in the uplink.